NATURE-STUDIES WITH BIRDS FOR THE ELEMENTARY SCHOOL

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(With photographs from life by the author)

CONTENTS

The suggestions contained in these articles, which will extend through several numbers of the *Elementary School Teacher,* are meant to help teachers who desire to make bird-study a part of the school work, but have not the necessary subject-matter at hand. Of course, the charts and other suggestions must be adapted to the ability of the group taught.

Every normal child is interested in birds, and it is but an easy task to nourish this interest into a great love for the beautiful creatures that flit about our homes and schools. Bird-study should be carried on throughout the entire year; but its chief field is opened in the spring when most of the birds return from their winter quarters in the South. Plans for receiving these birds should be made in the winter, and when spring comes each new arrival will be hailed with great delight and enthusiasm.

I. BIRD-HOUSES

Many birds make their homes in hollows in trees, fence-posts, and similar places. Where no nesting sites of this kind occur, houses should be made and put up to attract those birds that otherwise would seek homes elsewhere.

Bird-houses should be made of rough weathered lumber and should not be painted. They may be covered with bark, but care

must be taken to have the bark tightly fastened to the boards, or it will furnish excellent homes for insect pests. Lumber with the bark left on is extremely useful and makes some of the best houses.

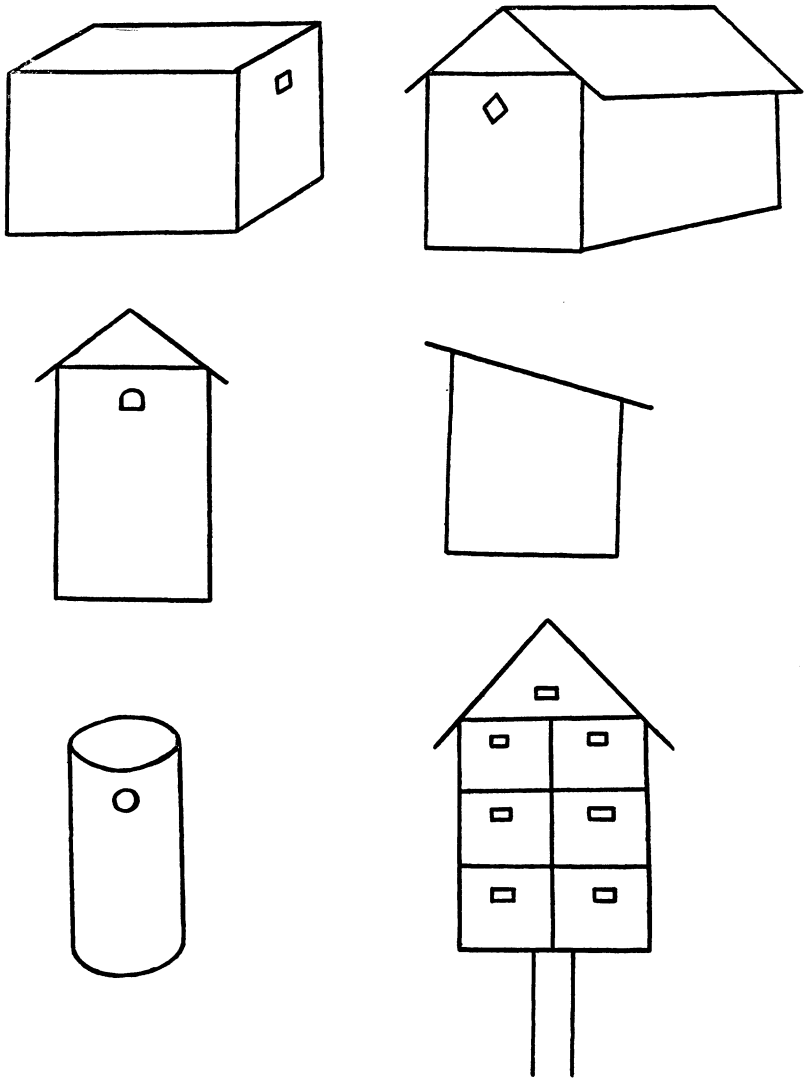
A section of the hollow limb of a tree makes a home most nearly like that which the bird naturally uses. This section should be plugged at both ends and an entrance made in the side. When a hollow limb is not obtainable, a limb may be bored out. Where pottery is taught, excellent houses of clay may be made which will serve admirably for wrens.

The position of the house is important and should be considered for each bird. The boxes must be well fastened, in a sheltered position, shielded both from the sun and from too close observation. The natural enemies must also be considered, and plans must be made to keep the cats and jays from disturbing the nests. If the house is in a tree or on a post, a little barbed wire coiled around the post about five feet below it will protect it from cats; jays and sparrows cannot get at the nest if there is no perch.

Bird-houses may be placed in suitable positions near the school, or may be taken home by the children. A record of the events which occur around the various bird-houses should be kept on charts which will be described later.

1. *House wren.*— The wren, although a very small bird, can use a relatively large house. It should be about $8 \times 6 \times 6$ inches inside. Near the top of one end an opening $1\frac{1}{4}$ inches in diameter should be made for the entrance. A perch is not necessary, and is better left off, as it allows the English sparrows and other depredators to get at the contents. The house should be placed in a tree or on the side of a building 7–15 feet from the ground. It is safest when nailed to a building where it is out of reach of cats.

The nest is built with a foundation of twigs and a superstructure of finer vegetable matter. In a hollow in the mass of twigs at the back of the box is constructed the nest proper, which is made of dry grass and lined with horsehair and a few feathers. The wren, when not furnished with a box, nests in cavities in trees, stumps, or fence-posts. Numerous extraordinary nesting sites have been recorded, such as old hats, shoes, coat sleeves, and tin cans. If more than one bird-house is put up, one pair of birds



will fill them all with twigs, choosing one of them for raising the young.

The arrival of the wren varies according to latitude. It is first heard in Chicago about April 20. The nest is begun in the middle of May. The eggs number from five to nine, and are pro-

fusely marked with fine brown spots. Two broods, and sometimes three, are reared in a season.

2. *Chickadee.*— This little black-capped fellow is almost exactly the size of the wren, but uses a smaller house. A box $3 \times 3 \times 7$ inches inside, with an entrance $1\frac{1}{4}$ inches in diameter on one side near the top, makes a very acceptable chickadee home. This house should be placed with its long diameter perpendicular to the earth, in a tree or against a building, about 10 feet from the ground.

The chickadee in its natural haunts rears its young in the hollow of a tree. The nest is made of soft moss, a few feathers, and the hairs of different animals. From six to ten eggs are laid — pure white with a reddish tint, and spotted with reddish-brown at the larger end.

Chickadees are with us the entire year. Their nests are built about the first of May, and two broods may be reared in a season.

3. *Bluebird.*— The bluebird is larger than the chickadee and wren, and needs a larger home. Its house should be $10 \times 6 \times 6$ inches inside. The entrance is in one end, from 2 to $2\frac{1}{2}$ inches in diameter. Place the house in a position similar to that of the wren. The top of a post is a favorable site.

The bluebird's natural nesting-place is a hollow in a stump, fence-post, or tree. It often makes use of a tin can lodged in a fence-corner, and is partial to the old deserted nestholes of woodpeckers.

The nest consists of soft grasses. Five light-blue eggs are usually laid, and two or three broods are reared during the nesting-season.

Bluebirds may be looked for about the last of March. They mate about the last week in April. Bird-houses for them should therefore be in place by the end of March. Care must be taken to protect the bluebirds from the English sparrows, which are ever ready to drive out the real owners and appropriate the house.

4. *Purple martin.*— Unlike the other birds mentioned in this article, the martin is sociable and seems to enjoy the company of its fellows. Its house may be built with compartments which will allow several pairs to occupy it at the same time. The compart-

ments should be about $9 \times 7 \times 7$ inches inside. The entrances should be $2\frac{1}{2}$ inches in diameter, near the top of the compartments. Many elaborate and beautiful houses are possible, as the martins are not afraid of homes constructed by human beings. The house should be placed on top of a building or on a tall post.

5. *Screech owl.*— Suitable nesting-places for this bird are not common, and a bird-house, if carefully made, may attract a tenant. It should be $16 \times 8 \times 8$ inches inside, and may have the top left open for an entrance or a hole 4 inches in diameter in one side near the top. Owls do not build nests, but lay their eggs on the rubbish found at the bottom of holes in trees. It would therefore be well to line the house with leaves to tempt any visitors to remain. The sides of the house should be covered with bark to make it resemble the tree in which it is placed.

II. BIRD CHARTS

Most children, even before entering school, have made original observations of numerous nature subjects. It is the duty of the teacher to help the pupils arrange these observations so as to make them of permanent value. This is best done by means of charts, a number of which are described below.

1. *Description chart.*— Before much can be done with the description of a bird, one must have in mind a definite idea of its topography. The accompanying diagram of the principal parts of a bird may be copied on the blackboard, and no difficulty in naming external features will be possible. The description chart is very flexible, and may be made as simple or complete as desired. One answering the needs of all ordinary studies will contain the following points:

DESCRIPTION CHART OF BIRDS

Locality..... Date.....
Common name .....
Scientific name .....
Male, female, or young .....
Comparative size..... Length.....
Color:

forehead	crown	nape .....
back	rump	tail .....
abdomen	breast	throat .....
wings	other markings	

SCREECH OWL

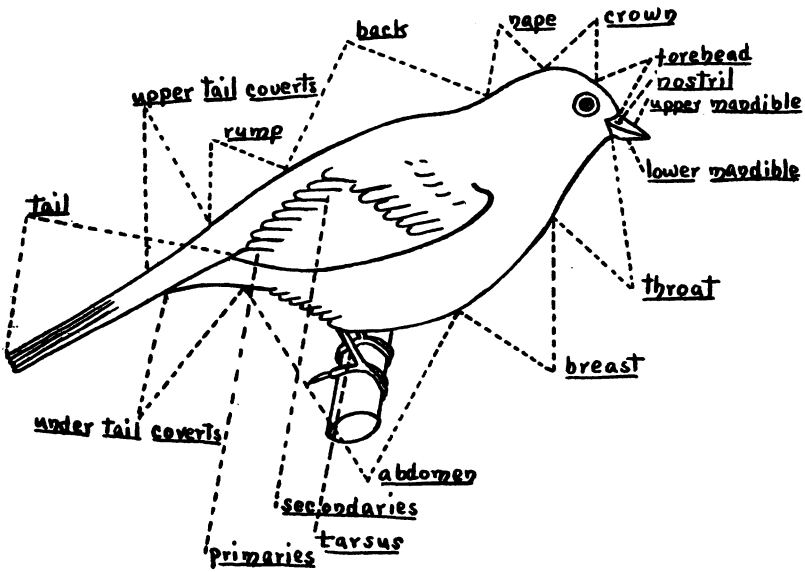
CHICKADEE BRINGING FOOD TO YOUNG IN CAVITY IN BIRCH STUB

NEST OF HOUSE WREN IN BIRD-HOUSE

Features (size, shape, etc.):

body	neck	legs	
feet	head	beak	
wings	tail	.....	

The bird should be compared, first, in size with any common bird known by all the children, e. g., the English sparrow. A study of legs and neck will show how the birds adapt themselves to conditions; for example, the wading birds will be found to have long necks and long legs. The beaks will indicate the kind



of food on which the bird lives, or the kind of home it builds. Numberless points of this kind may be brought out as the studies proceed.

2. *Bird calendar.*— Part of the blackboard may be reserved for the bird calendar, which should be begun in the winter. In the various spaces, as shown below, place (1) the name of the bird; (2) when first seen; (3) by whom first seen; (4) whether a permanent resident, summer resident, winter resident, or visitor; and (5) whether common, moderately common, or rare. A few

minutes each day will be found sufficient to get reports of observations and to keep up the interest.

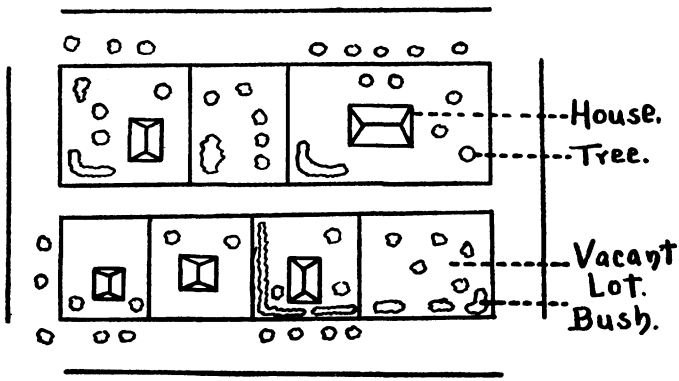
Name	First Seen	By Whom	Resident or Visitor	Common or Rare

BIRD CALENDAR

This chart serves admirably as a list of the birds found in the neighborhood of the school. Children may be impressed with the value of this work if blanks are obtained from the government at Washington, D. C., on which to make their records. These blanks may be had by addressing the United States Department of Agriculture, Division of Ornithology. They are sent out every year to ornithologists all over the United States; and the reports thus obtained are used to plot out the paths of bird migrations.

In connection with the calendar a list of old birds' nests may be made. The number of nests that were overlooked during the summer will surprise everyone. The nests, if collected, may be accurately labeled by referring to a reliable bird-book, and will make valuable museum specimens.

3. *Bird census.*— An idea of the number of birds that are residents may be gained if a bird census is made of a certain chosen piece of territory. A city square on which there are a number of trees and bushes answers the purpose very well. The birds' nests should be searched for diligently on this territory, and a census made each year will show the increase or decrease in resident birds. The census should be aided by a drawing of the square, with each tree and shrub carefully delineated and named, and each nest marked by a color, the color scheme to be described at the bottom of the drawing.



4. *Life-history chart.*— The series of events that go to make up the life-history of a bird should be arranged in logical order, as in the life-history chart.

The data contained in this chart are part of the results of work carried on by the sixth-grade children in the Elementary School of the School of Education during the spring of 1904.

5. *Food chart.*— A knowledge of the kinds and amount of food consumed by birds is of great importance, as few realize their great economic value. Careful observation is necessary, and a field-glass is very useful in determining the nature of the food taken by the birds. A nest of young furnishes the best subject for study, as it is very easy to take up a position near the nest and make a list of the different kinds of material the mother and father feed to their offspring.

The children will be interested in the results that have been arrived at by the men who have had the economic ornithological work in hand at Washington, D. C. One of the best reports is by Dr. A. K. Fisher and is entitled *The Hawks and Owls of the United States in Their Relation to Agriculture.* This was published in 1893 as Bulletin No. 3 by the Division of Ornithology and Mammalogy of the United States Department of Agriculture. Many other reports have been issued which include food-studies of most of the common birds. These may be obtained free of charge by addressing the Department of Agriculture, Division of Ornithology, at Washington, D. C. The men at Washington

Name	Arrive	Nest				Eggs		Incubation	Young in Nest	No. of Broods	Depart
		Builds	Location	Height	Material	No.	Color				
Robin	March early	April late	In tree crotch	5–25 ft.	Mud grass	4	Pale blue	14 days		2 or 3	October

Name	Beneficial Animal	Harmful Animal	Beneficial Vegetable	Harmful Vegetable	% Ben. An.	% Harm An.	% Ben. Veg.	% Harm Veg.	Species Ben. or Harm.

FOOD CHART OF BIRDS

examine the food-contents of the stomachs of birds from many localities, and draw definite conclusions from the results. For example, Mr. Fisher examined 255 stomachs of the screech owl, and the following is his summary:

Of 255 stomachs examined, 1 contained poultry; 38, other birds; 91, mice; 11, other mammals; 2, lizards; 4, batrachians; 1, fish; 100, insects; 5, spiders; 9, crawfish; 7, miscellaneous; 2, scorpions; 2, earthworms; and 43 were empty.

Mr. Fisher (p. 11) divides the forty-nine species and twenty-four subspecies of rapacious birds into four classes, as follows:

a) Those wholly beneficial or wholly harmless.

b) Those chiefly beneficial.

c) Those in which the beneficial and harmful qualities seem to balance each other.

d) Those positively harmful.

The fourth group, which is of chief interest, contains only six species: sharp-shinned hawk, Cooper's hawk, goshawk, duck hawk, the gyrfalcons, and fish hawk.

The birds of prey then, instead of being killed wherever possible, as they generally are at present, should be carefully protected. This fact once learned by a child will have a lasting effect upon his attitude toward birds, and will lead him to use his influence on his companions.

6. *Habit chart.*— Birds are individuals, and the members of each species have certain habits in common. We find that the robin runs along the ground, the grackle walks, and the blue jay hops. Such facts as these should be recorded in the habit chart.

HABIT CHART OF BIRDS

Habitat (near water, meadows, trees, etc.).....
Nesting-site (on ground, in bush, etc.).....
Manner of flight (undulating, slow, soars, etc.).....
Movements in trees (creeps, clings, perches, etc.).....
Movements on ground (runs, walks, etc.).....
Food-getting habits (catches insects in flight, etc.).....
Character of food (animal, vegetable, insect, etc.).....
Position while at rest (perched on limb, etc.).....
Other habits .....
Song or call:
where given (in flight, on ground, etc.).....
when given (early morning, twilight, etc.).....

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[*To be continued*]